

# *The African Organisation for Standardisation*

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ARS 927 (2012) (English): Fresh kales --  
Specification



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## Fresh kales — Specification



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## Foreword

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This African Standard was prepared by the ARSO Technical Harmonization Committee on Agriculture and Food Products (ARSO/THC 1).

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## Introduction

Kales or borecole (*Brassica oleracea* Acephala Group) are a variety of cabbage that belongs to the plant family Brassica. Kale has been traditionally popular in East Africa (where it is called *sukuma wiki*) but is currently gaining global attention due to its nutrient rich phytochemical content, which provides health benefits. Kale is rich and abundant in calcium, lutein, iron, and vitamins A, C, and K. Kale has seven times the beta-carotene of broccoli and ten times more lutein. Kale is rich in vitamin C, not to mention the much-needed fibre and the natural occurring all-important phytochemicals sulforaphane and indoles which research suggests may protect against cancer.

This African Standard was prepared to provide requirements necessary to facilitate trade for fruits and vegetables noting the significance of these products in agriculture and rural development as well as poverty alleviation.

Draft African Standard for comments only — Not to be cited as African Standard





## Fresh kales — Specification

### 1 Scope

This African Standard applies to kale leaves, plants, or bunches of kale leaves or plants, of the varieties grown from *Brassica carinata*, but shall not be applicable to mixtures of kale leaves, plants, or bunches of kale leaves or plants.

NOTE Kales are also obtained from the following *Brassica* varieties:

- *Brassica oleracea* var. *acephala*; subgroup *laciniata*; kale, collards, curly kale; dwarf type, highly curled foliage.
- *Brassica oleracea* var. *acephala*; subgroup *plana*; smooth-leafed kale; a smooth rosette type.
- *Brassica oleracea* var. *acephala*; subgroup *millecapitata*; thousand-head kale; tall-growing form, producing whorls of young shoots high above the soil.
- *Brassica oleracea* var. *acephala*; subgroup *palmifolia*; tree kale; tall (>2 m).
- *Brassica oleracea* var. *acephala*; subgroup *medullosa*; marrow-stem kale; long, thickened stems, occasionally curled.

### 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ARS 53, *General principles of food hygiene — Code of practice*

ARS 56, *Prepackaged foods — Labelling*

CAC/GL 21, *Principles for the establishment and application of microbiological criteria for foods*

CAC/RCP 44, *Recommended international code of practice for the packaging and transport of tropical fresh fruits and vegetables*

CAC/RCP 53, *Code of hygienic practice for fresh fruits and vegetables*

CODEX STAN 193, *Codex general standard for contaminants and toxins in food and feed*

ISO 874, *Fresh fruits and vegetables — Sampling*

ISO 2169, *Fruits and vegetables — Physical conditions in cold stores — Definitions and measurement*

ISO 6561-1, *Fruits, vegetables and derived products — Determination of cadmium content — Part 1: Method using graphite furnace atomic absorption spectrometry*

ISO 6561-2, *Fruits, vegetables and derived products — Determination of cadmium content — Part 2: Method using flame atomic absorption spectrometry*

ISO 6633, *Fruits, vegetables and derived products — Determination of lead content — Flameless atomic absorption spectrometric method*

ISO 6634, *Fruits, vegetables and derived products — Determination of arsenic content — Silver diethyldithiocarbamate spectrophotometric method*

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ISO 6637, *Fruits, vegetables and derived products — Determination of mercury content — Flameless atomic absorption method*

ISO 7563, *Fresh fruits and vegetables — Vocabulary*

ISO 7952, *Fruits, vegetables and derived products — Determination of copper content — Method using flame atomic absorption spectrometry*

ISO 9526, *Fruits, vegetables and derived products — Determination of iron content by flame atomic absorption spectrometry*

ISO 17239, *Fruits, vegetables and derived products — Determination of arsenic content — Method using hydride generation atomic absorption spectrometry*

## 3 Definitions

For the purposes of this standard, the terms and definitions in ISO 7563, and the following terms and definitions apply.

### 3.1

#### **one type**

the kale in any container shall have the same general character of growth and colour; i.e., curly leaf type and distinctly smooth leaf types shall not be mixed, and distinctly purple type plants shall not be mixed with green or blue type kale. As blue type kale often shows a purplish tinge on some leaves while other plants of this type may not show this colour, such a mixture shall be considered as one type.

### 3.2

#### **well-trimmed**

the butt is trimmed off to not more than three-fourths of an inch from the point of attachment of the outer leaves and that yellow, discoloured, dried or otherwise damaged leaves which materially affect the appearance of the plant have been removed

### 3.3

#### **damage**

any defect, or any combination of defects, which materially detracts from the appearance, or the edible or marketing quality of the plant. A plant shall be considered as damaged by a seedstem when the flower buds are dried or have opened, or when the seedstem extends above the top of the plant when the leaves are folded together around the seedstem, or if the removal of part of the seedstem has caused the appearance of the plant to be materially injured.

## 4 Provisions concerning quality

### 4.1 General

The purpose of the standard is to define the quality requirements of kales at the market control stage, after preparation and packaging.

### 4.2 Minimum requirements

**4.2.1** In all classes, subject to the special provisions for each class and the tolerances allowed, the kales must be:

- (a) intact
- (b) sound; produce affected by rotting or deterioration such as to make it unfit for consumption is excluded
- (c) clean and trimmed, i.e. practically free from all earth or other growing medium and practically free of any visible foreign matter

- (d) fresh in appearance
- (e) practically free from pests
- (f) practically free from damage caused by pests
- (g) turgescient
- (h) not running to seed
- (i) free of abnormal external moisture
- (j) free of any foreign smell and/or taste.

**4.2.2** The produce must be of normal development. The development and condition of the produce must be such as to enable it:

- (a) to withstand transportation and handling
- (b) to arrive in a satisfactory condition at the place of destination.

### **4.3 Classification**

The produce is classified as defined below:

#### **4.3.1 Class I**

Class I consists of kale of one type which are well trimmed, not stunted, free from decay and from damage caused by yellow or discoloured leaves, seedstems, wilting, bud burn, freezing, dirt, disease, insects, or mechanical or other means.

#### **4.3.2 Commercial class**

Commercial class consists of kale which meet the requirements of Class I except that bronze or slightly yellowish colour affecting only the edges of the leaves shall be permitted, provided these edges are not dried.

## **5 Provisions concerning sizing**

Sizing is not used in the grading of this produce.

## **6 Provisions concerning tolerances**

In order to allow for variations incident to proper grading and handling in each of the foregoing grades, the following tolerances, by count, are provided as specified:

### **6.1 Quality tolerances**

Ten percent in any lot which fail to meet the requirements of the specified grade, including therein not more than 1 percent affected by wet decay.

### **6.2 Application of tolerances**

Individual samples are subject to the following limitations:

- (a) For packages which contain 15 specimens or more and a tolerance of 10 percent or more is provided, individual samples in any lot may contain not more than one and one-half times the tolerance specified. For packages which contain 15 specimens or more and a tolerance of less than 10 percent is provided, individual samples may contain not more than double the tolerance

specified except that at least one defective specimen may be permitted in any sample provided that the average for the entire lot is within the tolerance specified for the grade.

- (b) For packages which contain less than 15 specimens, individual samples in any lot may contain not more than double the tolerance specified, except that at least one defective specimen may be permitted in any sample provided that the average for the entire lot is within the tolerance specified for the grade.

## 7 Provisions concerning presentation

### 7.1 Uniformity

The contents of each package must be uniform and contain only kales of the same origin, quality, colour and size (if sized).

The visible part of the contents of the package must be representative of the entire contents.

### 7.2 Packaging

Kales must be packed in such a way as to protect the produce properly. The materials used inside the package must be new<sup>1</sup>, clean, and of a quality such as to avoid causing any external or internal damage to the produce. The use of materials, particularly of paper or stamps bearing trade specifications is allowed, provided the printing or labelling has been done with non-toxic ink or glue.

Kales shall be packed in each container in compliance with CAC/RCP 44.

#### 7.2.1 Description of containers

The containers shall meet the quality, hygiene, ventilation and resistance characteristics to ensure suitable handling, shipping and preserving of kales. Packages must be free of all foreign matter and smell.

### 7.3 Presentation

Kales may be presented as kale leaves, plants, or bunches of kale leaves or plants.

## 8 Marking and labelling

### 8.1 Consumer packages

In addition to the requirements of ARS 56, the following specific provisions apply:

#### 8.1.1 Nature of produce

If the produce is not visible from the outside, each package shall be labelled as to the name of the produce and may be labelled as to name of the variety and/or commercial type.

### 8.2 Non-retail containers

Each package<sup>2</sup> must bear the following particulars, in letters grouped on the same side, legibly and indelibly marked, and visible from the outside:

#### 8.2.1 Identification

The exporter, packer and/or dispatcher shall be identified by name and physical address (e.g.

<sup>1</sup> For the purposes of this Standard, this includes recycled material of food-grade quality.

<sup>2</sup> Package units of produce prepacked for direct sale to the consumer shall not be subject to these marking provisions but shall conform to the national requirements. However, the markings referred to shall in any event be shown on the transport packaging containing such package units.

street/city/region/postal code and, if different from the country of origin, the country) or a code mark officially recognized by the national authority.<sup>3</sup>

### 8.2.2 Nature of produce

— kale leaves, plants, or bunches of kale leaves or plants

### 8.2.3 Origin of produce

Country of origin and, optionally, district where grown, or national, regional or local place name.

### 8.2.4 Commercial specifications

— Class

— Nature expressed by "Kale leaves", "Kale plants", "Bunched kale leaves" or "Bunched kale plants"

— Number of bunches or plants.

### 8.2.5 Official control mark (optional)

## 9 Contaminants

### 9.1 Pesticide residues

Fresh kales shall comply with those maximum pesticide residue limits established by the Codex Alimentarius Commission for this commodity.

### 9.2 Heavy metals

Kales shall comply with those maximum levels for heavy metals established by the Codex Alimentarius Commission for this commodity. The current limits are as indicated below:

Metal	Unit of measurement	Maximum limit	Test method
Lead (Pb)	mg/kg wet weight	0.30	ISO 6633 (AAS)
Cadmium (Cd)	mg/kg wet weight	0.050	ISO 6561-1 or 6561-2

## 10 Hygiene

**10.1** It is recommended that the produce covered by the provisions of this Standard be prepared and handled in accordance with the appropriate sections of ARS 53, CAC/RCP 53, and other relevant Codex texts such as Codes of Hygienic Practice and Codes of Practice.

**10.2** The produce should comply with any microbiological criteria established in accordance with CAC/GL 21.

<sup>3</sup> The national legislation of a number of countries requires the explicit declaration of the name and address. However, in the case where a code mark is used, the reference "packer and/or dispatcher (or equivalent abbreviations)" has to be indicated in close connection with the code mark, and the code mark should be preceded by the ISO 3166 (alpha) country/area code of the recognizing country, if not the country of origin.





**Siberian kales**

**Kale raab. Bok choy raab**



**Kale — Red Russian   Varieties of kale**





Common kales



**Brassica Nagoya**

***Brassica oleracea* var. *acephala***



***Brassica carinata* — Seeding farm**





Ridged kales — Lacinato



Sukuma wiki plant



Typical garden of kales





Bunches of kale

Draft African Standard for comments only

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*United States Standards for Grades of Kale*, Effective July 21, 2005

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